

**Q1:** Use Cholskey method to solve the following system.

$$4a + 2b + 14c = 14$$

$$2a + 17b - 5c = -101$$

$$14a - 5b + 83c = 155$$

**Q2:** Using the least square approximation, find the least square prediction line for the following data.

x	2	3	5	7	9
f(x)	0.6	1.2	1.9	3.7	5.9

**Q3:** Find the Lagrange interpolation polynomial for the following data and approximate value of  $f(x)$  for  $x = 4$

x	3	5	7	8
f(x)	3	1	6	4

**Q4:** Use the forward difference to approximate the derivative of  $\cos(x)$  at  $x = \pi/3$  for  
(a)  $h = 0.1$  (b)  $h = 0.01$  (c)  $h = 0.001$  (d)  $h = 0.0001$

**Q5:** Suppose you are given the following matrix. Verify whether  $\lambda = 2$  and  $\lambda = 3$  are two eigenvalues. Also find the eigenvectors.

$$A = \begin{Bmatrix} 1 & 1 \\ -2 & 4 \end{Bmatrix}$$